

**THERMOELECTRIC GENERATION SYSTEM  
UTILIZING A PRINTED-CIRCUIT THERMOPILE**

**ABSTRACT OF THE DISCLOSURE**

A thermoelectric generation system (26) is presented. A plurality of PC thermopiles (24), each consisting of a substrate having a plurality of thermocouples (TC), are coupled together by a backplane (42) to form a thermoarray (TA) capable of producing a desired voltage ( $E_{TA}$ ) at a desired current ( $I_{TA}$ ). Each thermocouple (TC) is formed of a first trace (28) formed of a first conductor (20) upon a first surface (32) of the substrate (30) and a second trace (34) formed of a second conductor (22) upon a second surface (36) of the substrate (30). A first junction ( $J_1$ ) formed between the first and second traces (28,34) is maintained at substantially a first temperature ( $T_1$ ), and a second junction ( $J_2$ ) formed between the first and second traces (28,34) is maintained at substantially a second temperature ( $T_2$ ), so that each thermocouple (TC) generates a voltage ( $E_{TC}$ ) and a current ( $I_{TC}$ ). These voltages ( $E_{TC}$ ) and currents ( $I_{TC}$ ) are concatenated to achieve the desired voltage ( $E_{TA}$ ) and current ( $I_{TA}$ ).